

TCM-400DV

SERVICE MANUAL

Ver 1.0 2001.10

*E Model
Chinese Model
Tourist Model*



Model Name Using Similar Mechanism	New
Tape Transport Mechanism Type	MT-400-175

SPECIFICATIONS

Recording system

2-track 1 channel monaural

Tape speed

4.8 cm/s or 2.4 cm/s

Frequency range

250 - 6 300 Hz using nomal (TYPE I) cassette (with REC TIME switch at "NORMAL")

Speaker

Approx. 3.6 cm (1 ⁷/₁₆ in.) dia.

Power output

250 mW (at 10 % harmonic distortion)

Input

Microphone input jack (minijack)
sensitivity 0.2 mV for 3 k Ω or
lower impedance microphone

Output

Earphone jack (minijack) for 8 -300 Ω earphone

Variable range of the tape speed

From approx. +30% to -15% (with REC TIME switch at "NORMAL")

Power requirements

3 V DC batteries R6 (AA) x 2/
External DC 3 V power sources

Dimensions (w/h/d) (incl. projecting parts and controls)

Approx. 86.7 x 114.4 x 35.4 mm
(3 ¹/₂ x 4 ⁵/₈ x 1 ⁷/₁₆ in.)

Mass

Approx. 160 g (5.7 oz.) (main unit only)

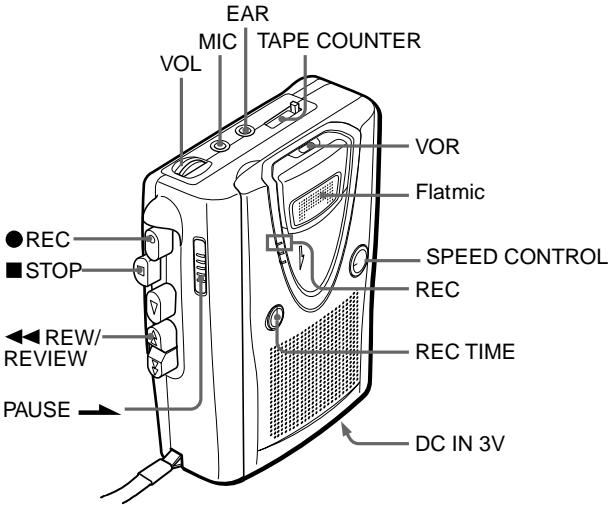
Design and specifications are subject to change without notice.

CASSETTE-CORDER

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This section is extracted from instruction manual.



Flexible Circuit Board Repairing

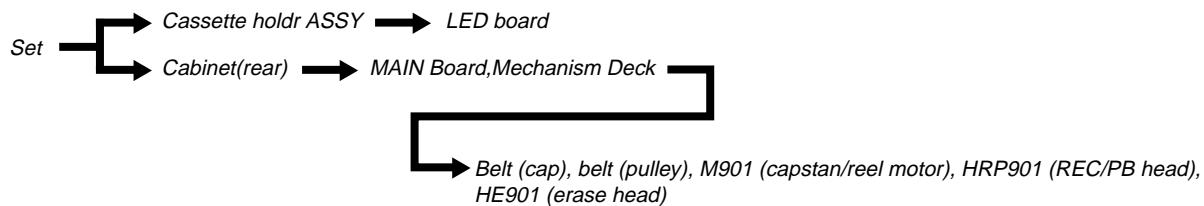
- Keep the temperature of the soldering iron around 270 °C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

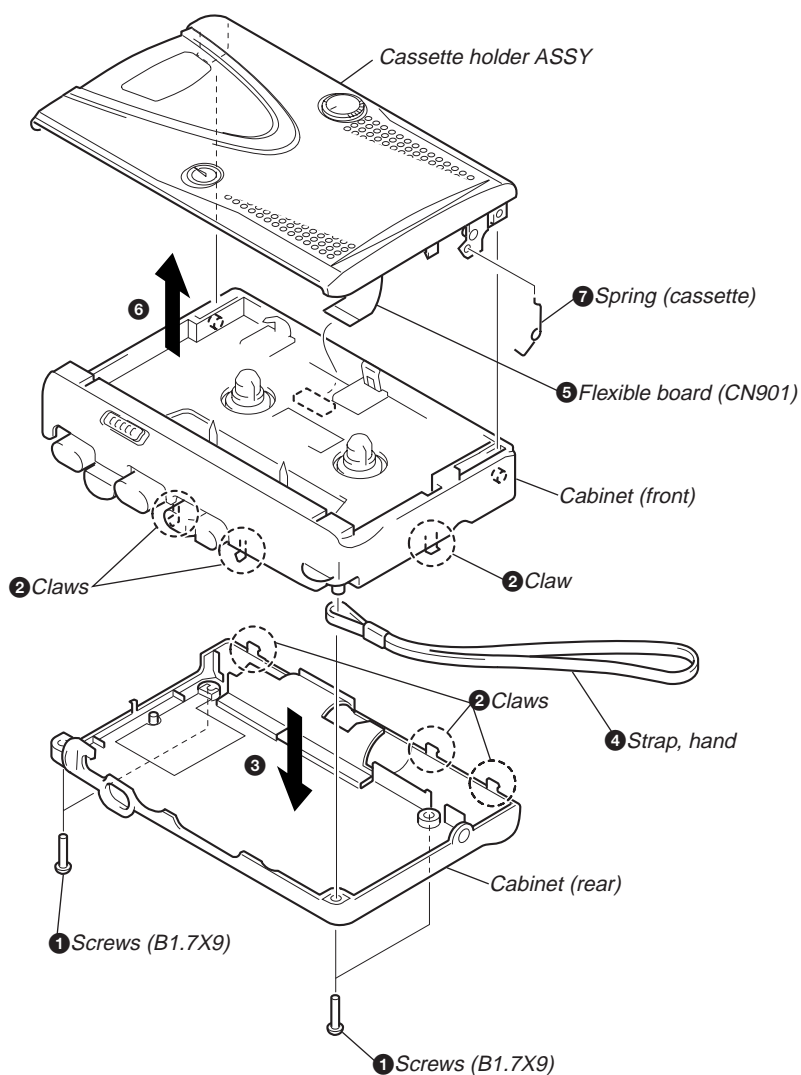
SECTION 2 DISASSEMBLY

- This set can be disassembled in the order shown below.

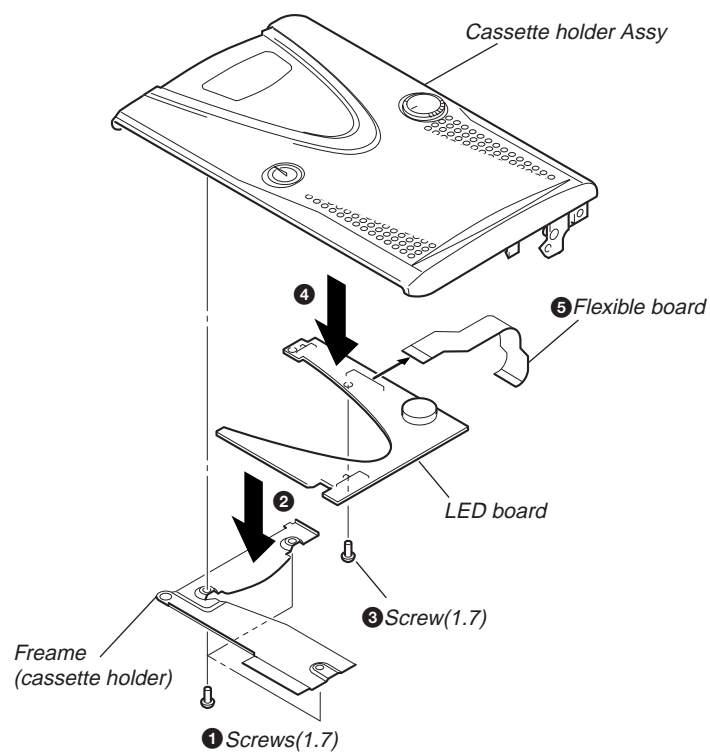


Note: Follow the disassembly procedure in the numerical order given.

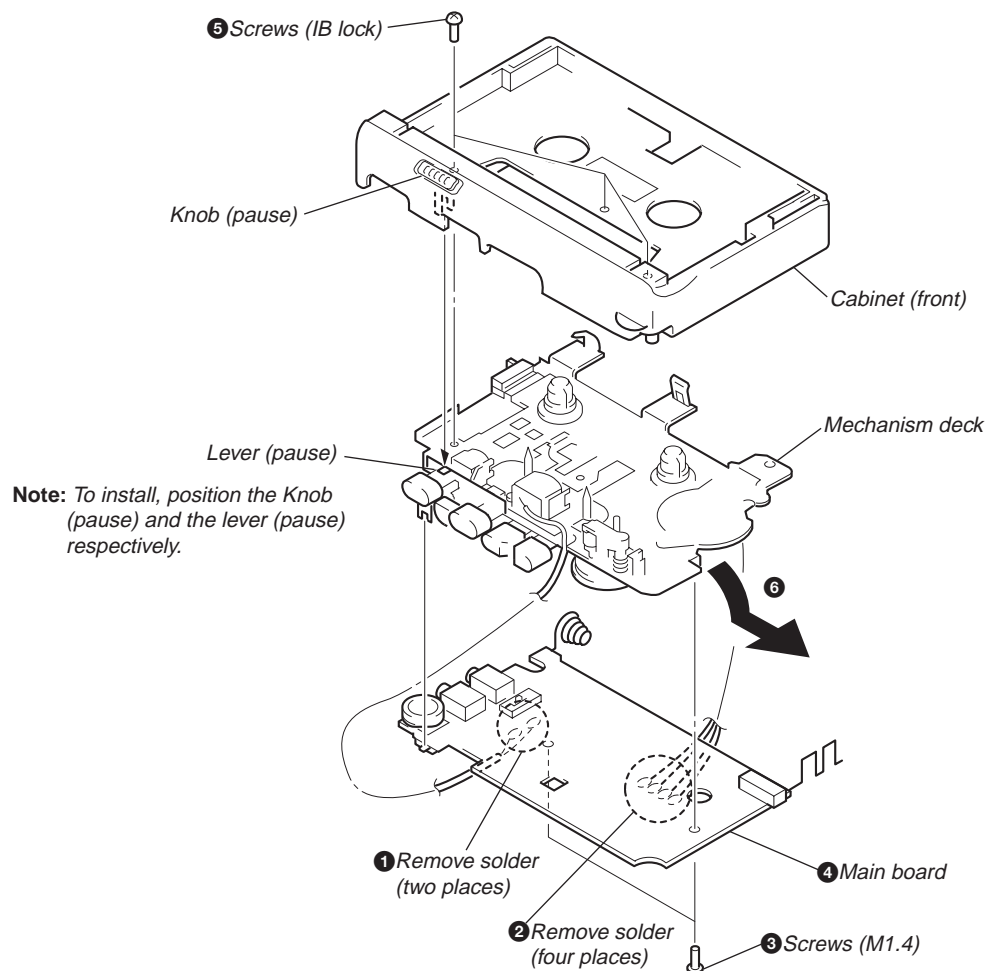
2-1.CABINET (REAR), CASSETTE HOLDER ASSY



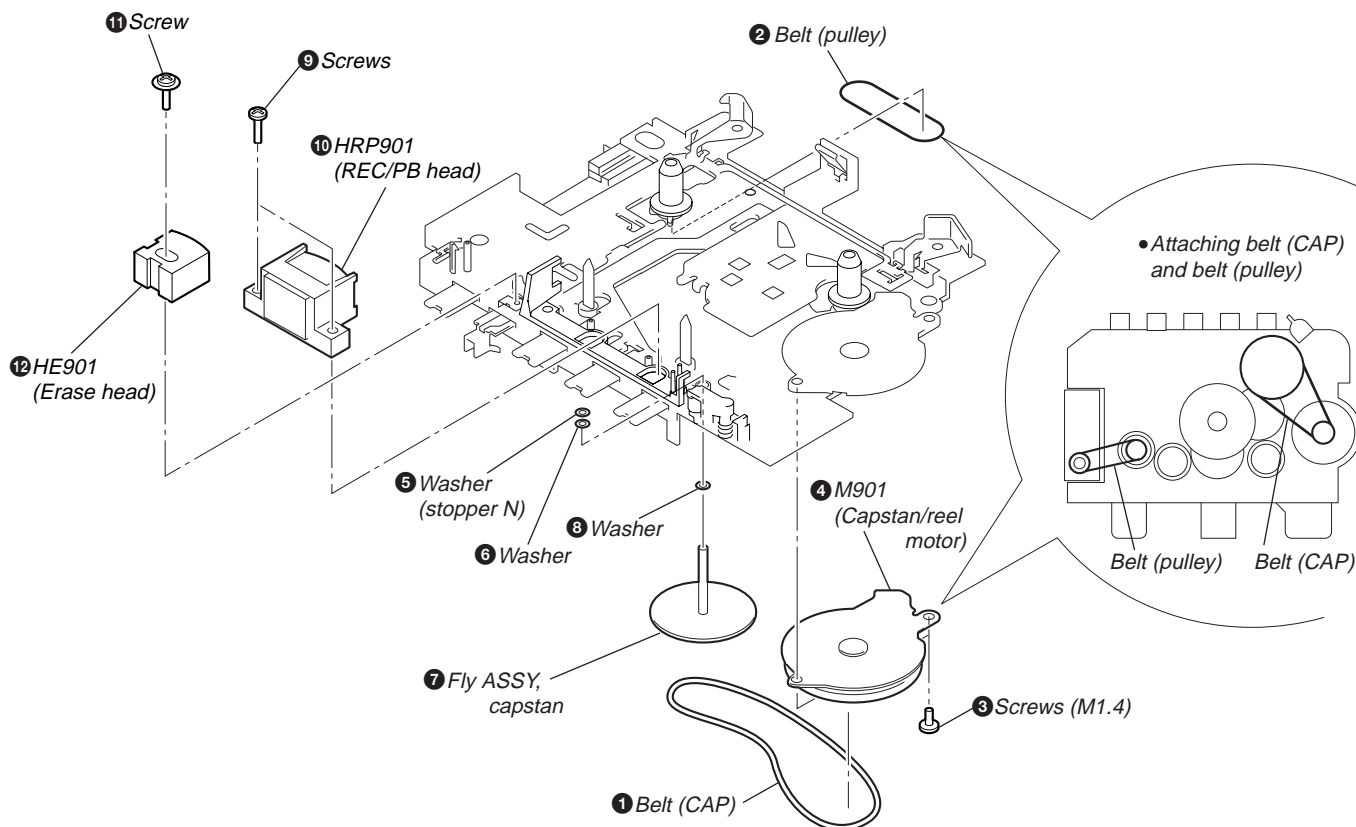
2-2. LED BOARD



2-3. MAIN BOARD, MECHANISM DECK



2-4. BELT (CAP), BELT (PULLEY), M901 (CAPSTAN/REEL MOTOR), HRP901 (REC/PB HEAD), HE901 (ERASE HEAD)



SECTION 3 MECHANICAL ADJUSTMENTS

- Clean the following parts with a denatured-alcohol-moistened swab:

record/playback head	pinch roller
erase head	rubber belt
capstan	
- Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
- Do not use a magnetized screwdriver for the adjustments.
- After the adjustments, apply suitable locking compound to the parts adjusted.
- The adjustments should be performed with the rated power supply voltage (2.5 V) unless otherwise noted.

Torque Measurement

Mode	Torque Meter	Meter Reading
FWD	CQ-102C	1.97 – 3.92mN•m (20 – 40 g•cm) (0.28 – 0.55 oz•inch)
Forward Back Tension		0.05 – 0.49 mN•m (0.5 – 5 g•cm) (0.007 – 0.069 oz•inch)
FF, REW	CQ-201B	more than 4.91 mN•m (more than 50 g•cm) (more than 0.69 oz•inch)

Tape Tension Measurement

Mode	Tension Meter	Meter Reading
FWD	CQ-403A	more than 50 g (more than 1.76 oz)

SECTION 4 ELECTRICAL ADJUSTMENTS

Setting:

- Supplied voltage: 2.5 V
- Switch and control position
 - VOL control (RV101) : mechanical center
 - PAUSE switch (S601) : OFF
 - SPEED CONTROL (RV603): center click
 - VOR switch (S901) : OFF

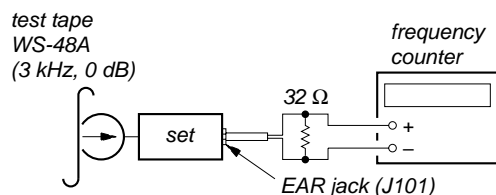
Test Tape

Type	Signal	Used for
WS-48A	3 kHz, 0 dB	tape speed adjustment

0 dB=0.775 V

Tape Speed Adjustment

Mode: playback

Adjustment Location:**– MAIN BOARD (Conductor Side) –****Procedure:**

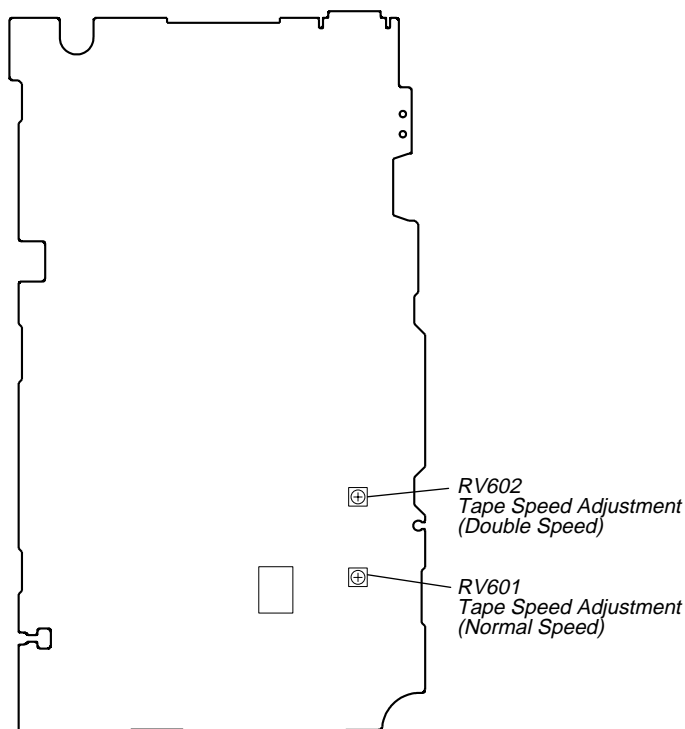
1. Set [REC * TIME] switch (S902) to NORMAL (4.8 cm/s) position, and playback the tape (WS-48A) .
2. Adjust RV601 so that frequency counter reading becomes 3,000 Hz.

Specification values: 2,990 to 3,010 Hz

3. Set [REC * TIME] switch (S902) to DOUBLE (2.4 cm/s) position.
4. Playback the tape from the beginning for two minutes, then adjust RV602 so that frequency counter reading becomes 1,500 Hz.

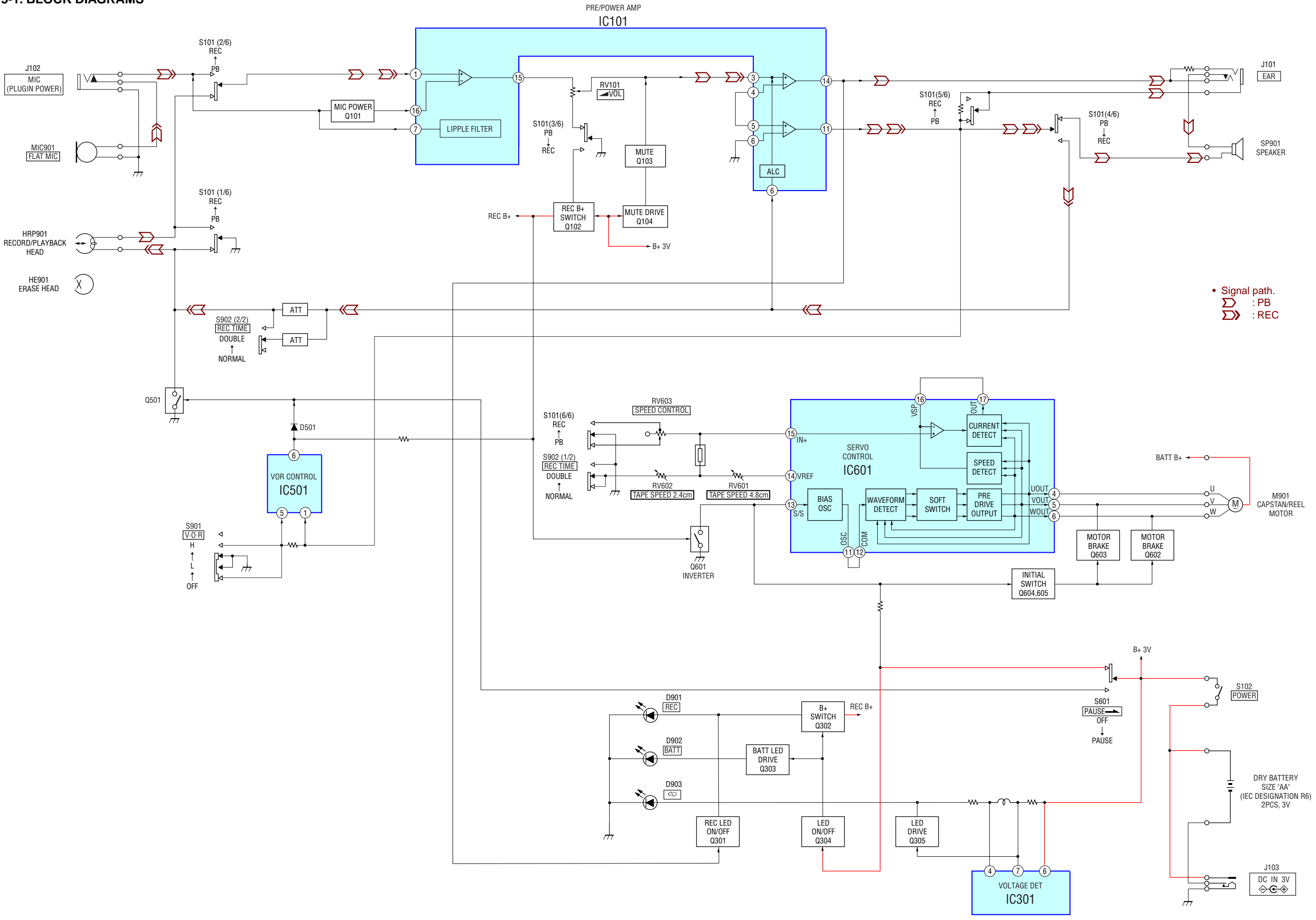
Specification values: 1,495 to 1,505 Hz

Confirm that deflection of the frequency counter reading between the beginning and the end of tape is within 2% (NORMAL: approx. 60 Hz, DOUBLE: approx. 30 Hz) .

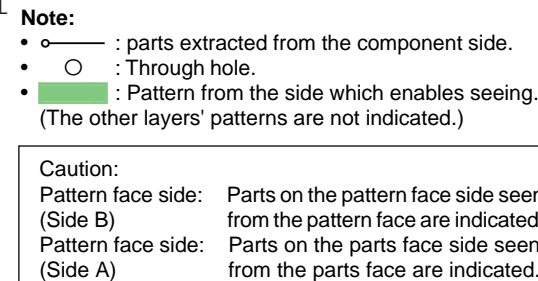


SECTION 5
DIAGRAMS

5-1. BLOCK DIAGRAMS



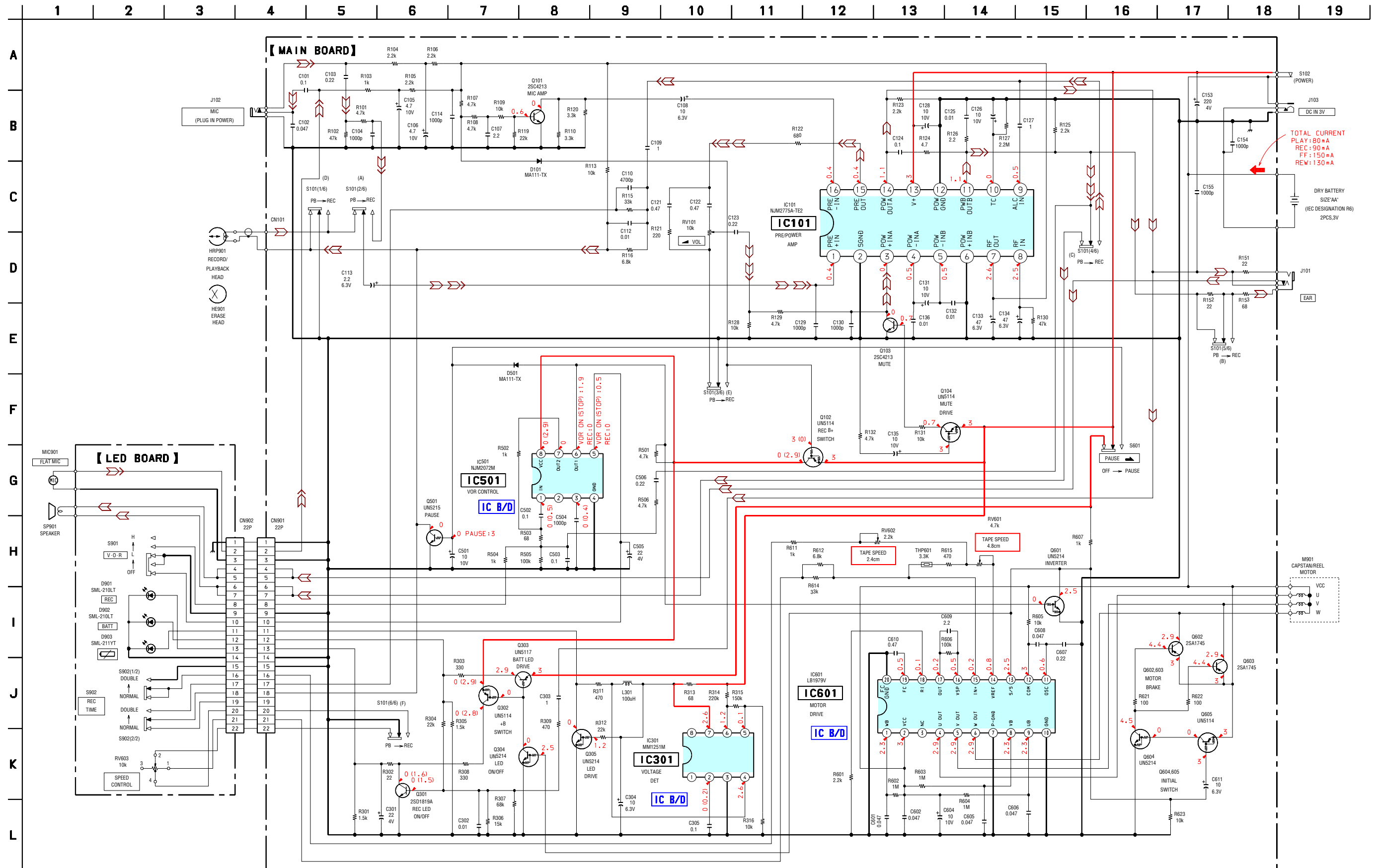
• Signal path.
➡ : PB
➡ : REC



Ref. No.	Location
D101	B-8
D501	D-7
IC101	C-7
IC301	F-6
IC501	E-7
IC601	F-8
Q101	C-8
Q102	D-8
Q103	C-8
Q104	D-8
Q301	E-7
Q302	F-6
Q303	F-7
Q304	F-7
Q305	E-6
Q501	D-7
Q601	F-8
Q602	F-7
Q603	F-7
Q604	F-8
Q605	F-7

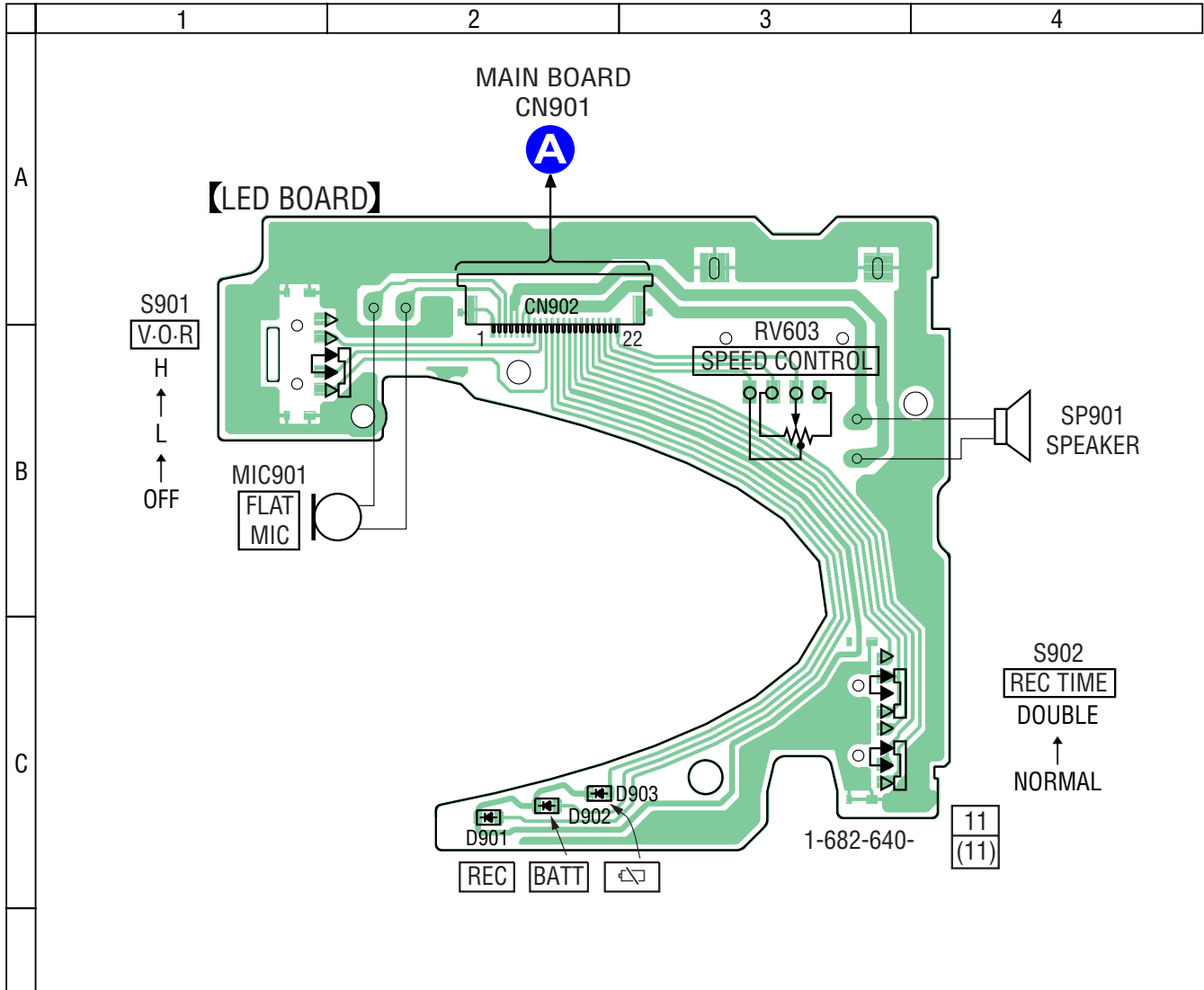
5-3. SCHEMATIC DIAGRAM

- See page 10 for Notes.
- See page 10 for IC Block Diagrams.



5-4. PRINTED WIRING BOARD - LED BOARD -

- See page 12 for Circuit Boards Location.



Note:

- ○ : parts extracted from the component side.
- ○ : Through hole.
- ■ : Pattern from the side which enables seeing. (The other layers' patterns are not indicated.)

Caution:

Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Pattern face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

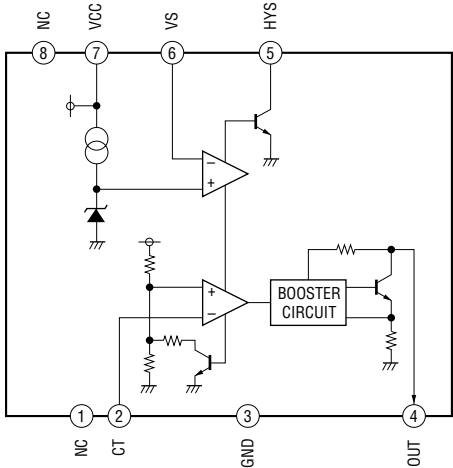
Note on schematic diagrams

- All capacitors are in μF unless otherwise noted. pF : μF
- 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $1/4\text{W}$ or less unless otherwise specified.
- ■ : B+ Line.
- □ : adjustment for repair.
- Power voltage is dc 3V and fed with regulated dc power supply from battery terminal .
- Voltages are dc with respect to ground under no-signal conditions.
- no mark : PLAY
- () : REC

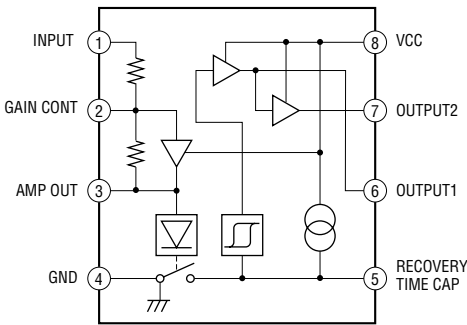
- Voltages are taken with a VOM (Input impedance 10 M Ω). Voltage variations may be noted due to normal production tolerances.
- Signal path.
 - ▷ : PB
 - ▷ : REC

5-5. IC BLOCK DIAGRAMS

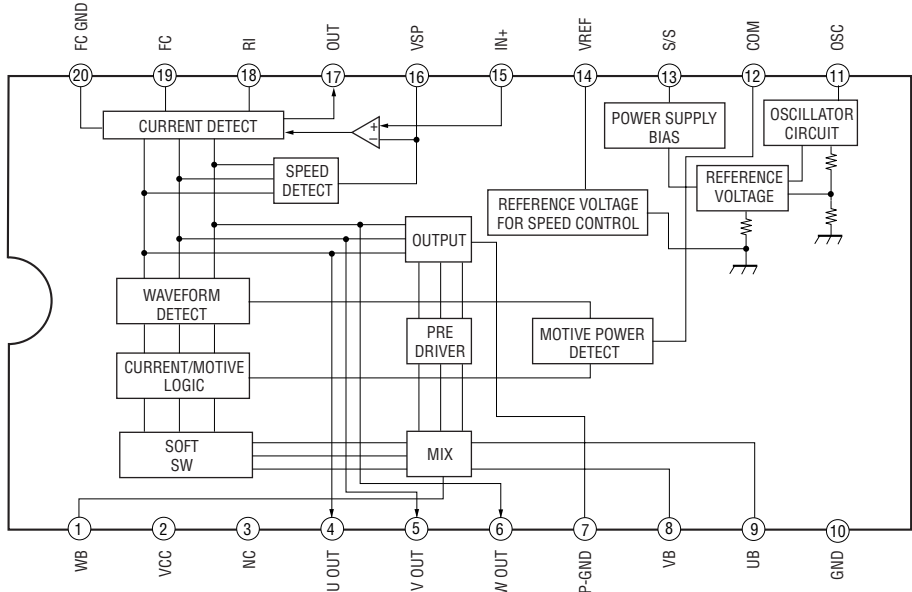
IC301 MM1251BFBE



IC501 NJM2072M (TE2)



IC601 LB1979VS-TLM



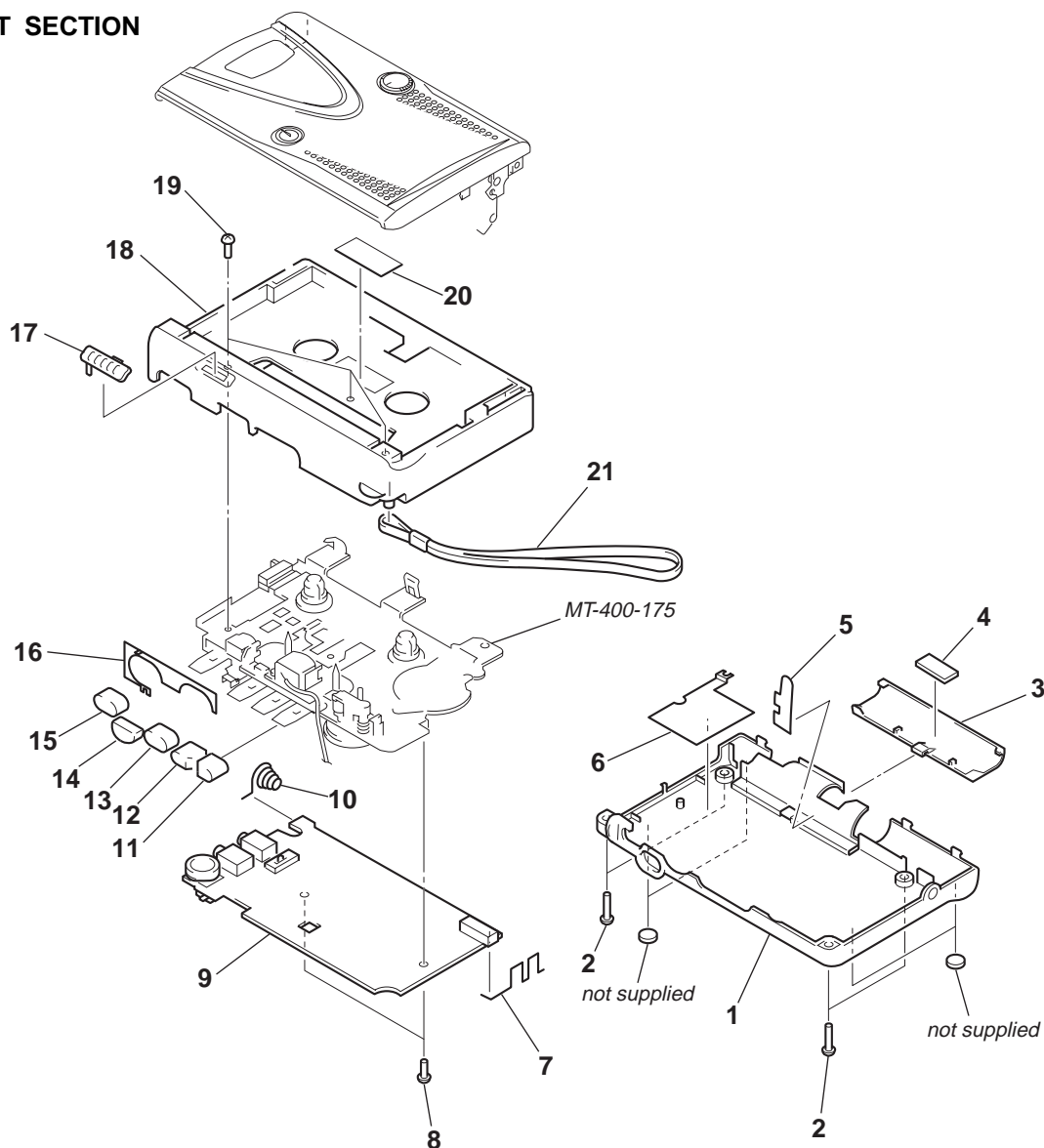
SECTION 6 EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

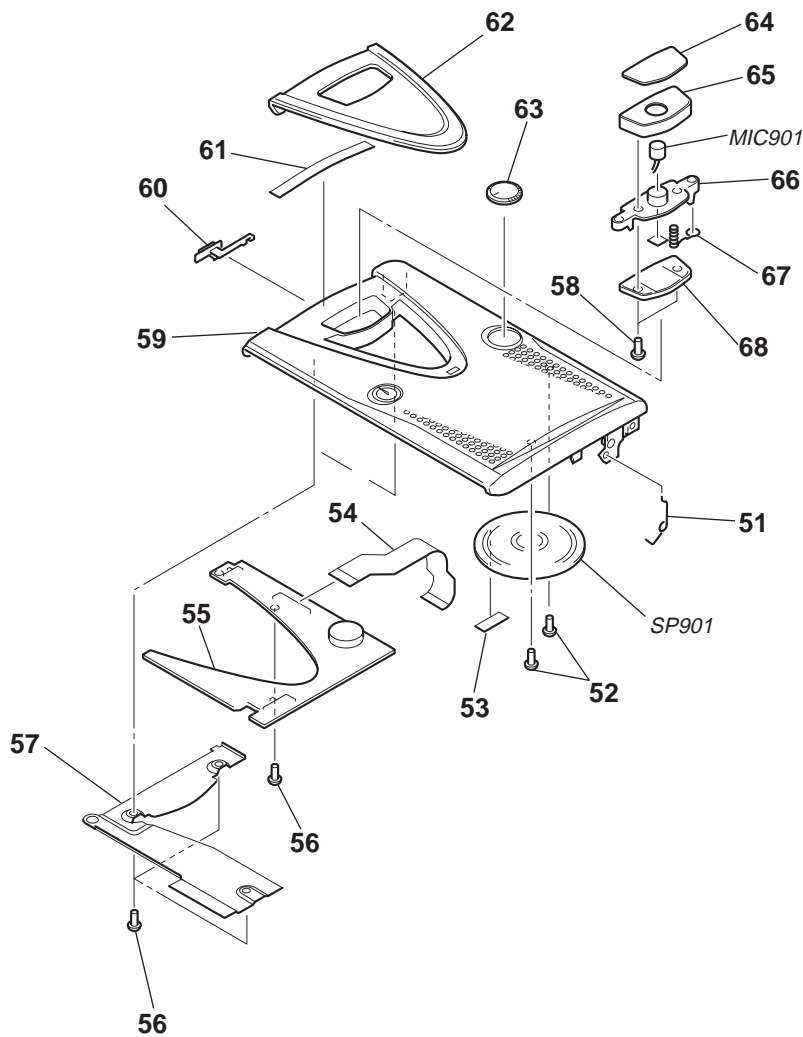
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories are given in the last of this parts list.
- Abbreviation
JEW : Tourist
CH : Chinese
1E : No Indication of country of origin
E : Indication of country of origin

6-1. CABINET SECTION



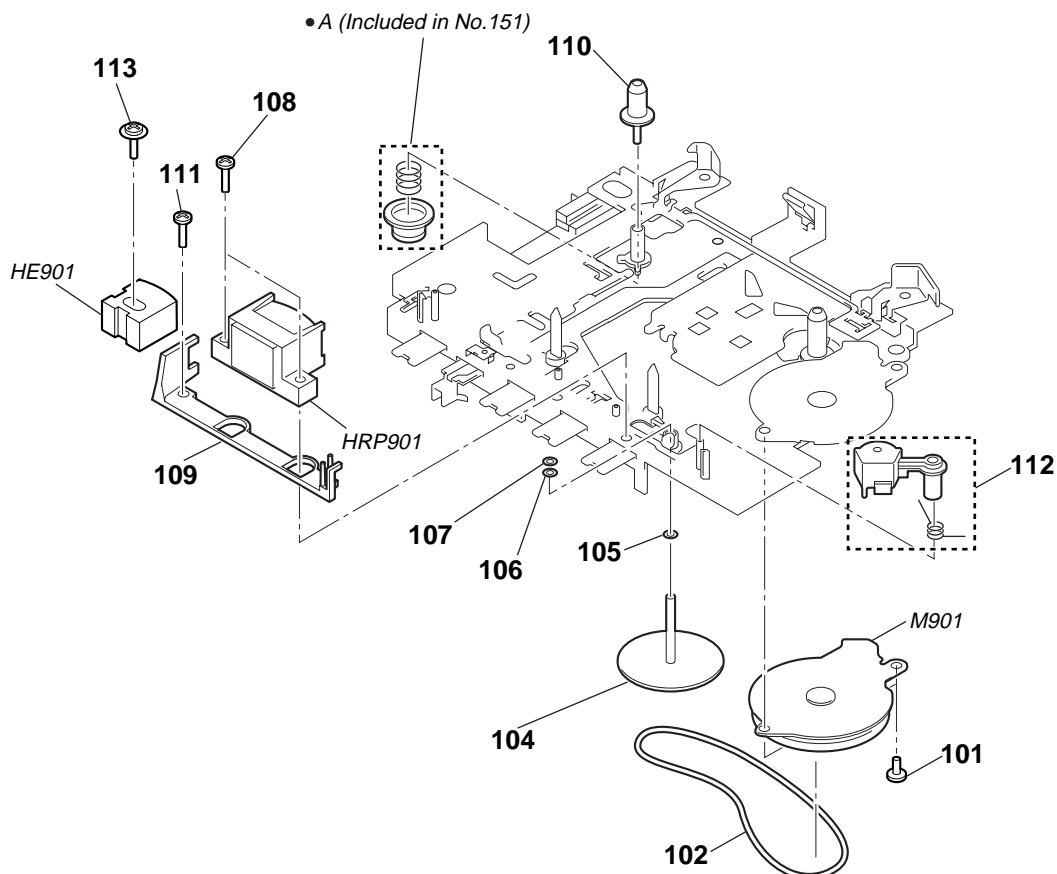
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	3-234-567-11	CABINET (REAR) (CH,E)		11	3-234-569-01	BUTTON (CUE)	
1	3-234-567-21	CABINET (REAR) (JEW)		12	3-234-570-01	BUTTON (REVIEW)	
1	3-234-567-31	CABINET (REAR) (1E)		13	3-234-568-01	BUTTON (PLAY)	
2	3-318-203-92	SCREW (B1.7X9), TAPPING		14	3-235-589-01	BUTTON (STOP)	
3	3-225-577-02	LID, BATTERY CASE		15	3-235-588-01	BUTTON (REC)	
4	3-914-930-11	CUSHION (BATTERY CASE LID)		16	3-234-856-01	LEVER (PAUSE)	
5	3-229-228-01	SHEET (BATTERY PICK)		17	3-234-561-01	KNOB (PAUSE)	
6	3-237-440-01	SHEET,SHIELD		18	3-234-566-11	CABINET (FRONT)	
7	3-226-525-01	TERMINAL (+)		19	3-704-197-42	SCREW (IB LOCK)	
8	3-345-648-01	SCREW (M1.4), TOOTHED LOCK		20	3-925-231-01	REFLECTOR	
* 9	A-3021-597-A	MAIN PC BOARD ASSY		21	3-328-319-01	STRAP, HAND	
10	3-226-526-01	TERMINAL (-)					

6-2. CASSETTE HOLDER SECTION



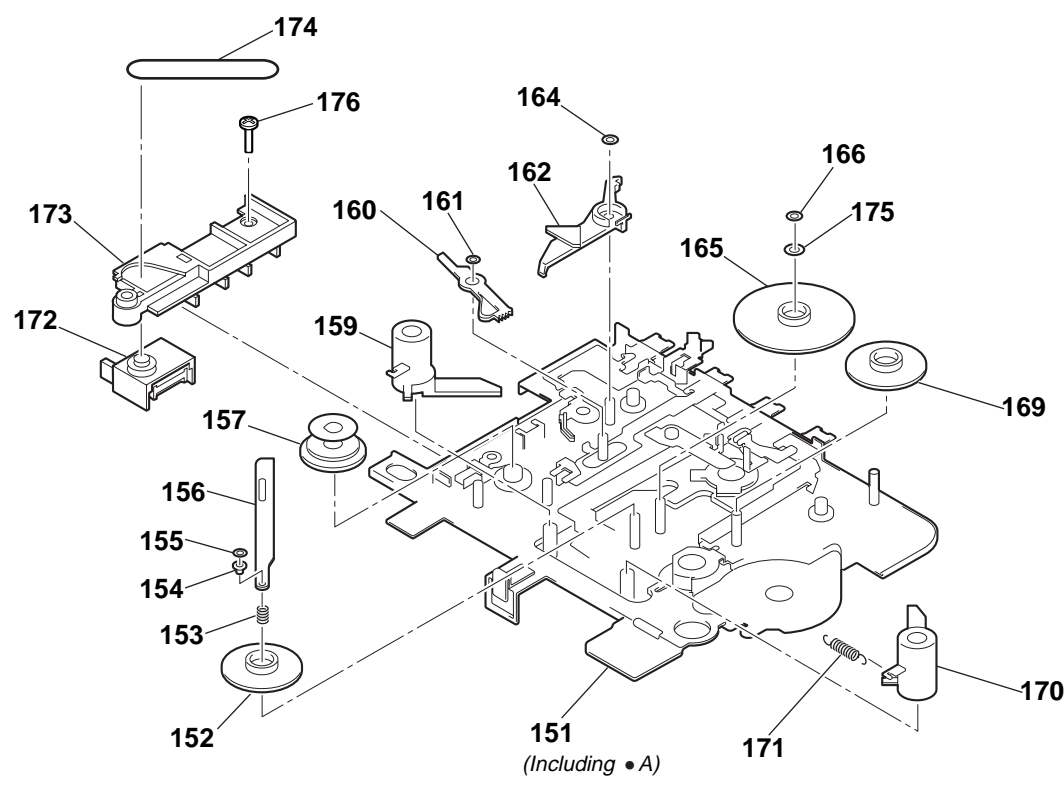
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	3-229-210-01	SPRING (CASSETTE)		61	3-237-279-01	WINDOW, ADHESIVE SHEET	
52	3-034-792-01	SCREW, TAPPING (B2.0)		62	3-234-554-11	WINDOW (CASSETTE)	
53	4-017-441-01	CUSHION (B)		63	3-234-557-01	KNOB (SPEED CONTROL)	
54	1-683-215-11	FLEXIBLE BOARD		64	3-234-562-01	PANEL (MIC)	
* 55	1-682-640-11	LED BOARD		65	3-234-564-01	CUSHION (MIC)	
56	3-318-382-04	SCREW (1.7), TAPPING		66	3-234-563-01	HOLDER (MIC)	
57	3-234-556-01	FRAME (CASSETTE HOLDER)		67	3-235-590-01	GROUND, COMPRESSION SPRING	
58	3-318-382-51	SCREW (1.7), TAPPING		68	3-234-565-01	COVER (MIC)	
59	X-3381-551-1	HOLDER ASSY, CASSETTE		MIC901	1-542-298-11	MICROPHONE, ELECTRET CONDENSER	
60	3-234-560-01	KNOB (VOL)		SP901	1-529-188-11	SPEAKER (3.6CM)	

6-3. SMECHANISM DECK SECTION-1 (MT-400-175)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	3-704-197-01	SCREW (M1.4), SPECIAL HEAD		110	3-019-776-01	GEAR (REEL-S)	
102	3-234-857-01	BELT (CAP)		111	3-703-816-24	SCREW (M1.4), SPECIAL HEAD	
104	X-3379-877-1	FLY ASSY (AR), CAPSTAN		112	X-3379-882-1	PINCH (N) ASSY, ARM	
105	3-386-694-01	WASHER		113	3-703-925-21	SCREW (M1.4)	
106	3-029-278-01	WASHER		HE901	1-500-515-11	HEAD, MAGNETIC (ERASE)	
107	3-029-275-01	WASHER (STOPPER N)		HRP901	1-500-717-11	HEAD, MAGNETIC (RECORE/PLAYBACK)	
108	3-703-816-73	SCREW (M1.4), SPECIAL HEAD		M901	1-763-772-11	MOTOR, DC (CAPSTAN/REEL)	
109	3-234-861-01	GUIDE (ARO), HEAD				(INCLUDING PULLEY)	

6-4. MECHANISM DECK SECTION-2 (MT-400-175)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
151	X-3381-206-1	CHASSIS ASSY (ARO)		164	3-321-813-71	WASHER, COTTER POLYETHYLENE	
152	3-225-385-01	GEAR (B)		165	X-3379-881-1	CLUTCH ASSY (AR)	
153	3-229-063-01	SPRING (UD) (R), COMPRESSION		166	3-315-384-31	WASHER, STOPPER	
154	3-019-778-01	SLEEVE (MS)		169	3-225-388-01	GEAR (D)	
155	3-728-091-01	WASHER, STOPPER		170	3-225-394-01	LEVER (FF ROTARY)	
156	3-225-427-01	WASHER, LEVER		171	3-225-444-01	SPRING (FR ROTARY), TENSION	
157	3-225-384-01	GEAR (A)		172	1-548-582-11	COUNTER, TAPE (SMALL TYPE)	
159	3-225-395-01	LEVER (REW ROTARY)		173	3-234-862-01	BRACKET (COUNTER)	
160	X-3380-677-1	LEVER (E DETECTION) ASSY		174	3-234-858-01	BELT (PULLEY)	
161	3-229-064-01	WASHER, STOPPER		175	3-344-901-01	WASHER, STOPPER	
162	3-225-393-01	LEVER (SHUT/OFF)		176	3-703-816-24	SCREW (M1.4X2.5), SPECIAL HEAD	

SECTION 7 ELECTRICAL PARTS LIST

MAIN

Note:

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
All resistors are in ohms
METAL: Metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F : nonflammable

- SEMICONDUCTORS
In each case, u: μ , for example:
uA...: μ A..., uPA...: μ PA..., uPB...: μ PB...,
uPC...: μ PC..., uPD...: μ PD...
- CAPACITORS
uF : μ F
- COILS
uH : μ H
- Abbreviation
JEW : Tourist
CH : Chinese
1E : No Indication of country of origin
E : Indication of country of origin

Ref. No.	Part No.	Description				Remark	Ref. No.	Part No.	Description				Remark
*	A-3021-597-A	MAIN BOARD, COMPLETE *****					C505	1-104-847-11	TANTAL. CHIP	22uF	20%	4V	
							C506	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V	
							C601	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V	
		<CAPACITOR>					C602	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V	
C101	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V		C604	1-104-851-11	TANTAL. CHIP	10uF	20%	10V	
C102	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V		C605	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V	
C103	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V		C606	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V	
C104	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V		C607	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V	
C105	1-135-210-11	TANTALUM CHIP	4.7uF	20%	10V		C608	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V	
C106	1-135-210-11	TANTALUM CHIP	4.7uF	20%	10V		C609	1-135-834-11	CERAMIC CHIP	2.2uF	10%	6.3V	
C107	1-135-834-11	CERAMIC CHIP	2.2uF	10%	6.3V		C610	1-117-863-11	CERAMIC CHIP	0.47uF	10%	6.3V	
C108	1-104-851-11	TANTAL. CHIP	10uF	20%	10V		C611	1-104-851-11	TANTAL. CHIP	10uF	20%	10V	
C109	1-115-156-11	CERAMIC CHIP	1uF		10V								
C110	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V				<CONNECTOR>				
C112	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V		CN901	1-573-362-11	CONNECTOR, FFC/FPC 22P				
C113	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V				<DIODE>				
C114	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V								
C121	1-113-619-11	CERAMIC CHIP	0.47uF		10V		D101	8-719-404-50	DIODE MA111-TX				
C122	1-113-619-11	CERAMIC CHIP	0.47uF		10V		D501	8-719-404-50	DIODE MA111-TX				
C123	1-165-128-11	CERAMIC CHIP	0.22uF		16V								
C124	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V				<IC>				
C125	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V								
C126	1-104-851-11	TANTAL. CHIP	10uF	20%	10V		IC101	6-701-379-01	IC NJM2775AM(TE2)				
C127	1-115-156-11	CERAMIC CHIP	1uF		10V		IC301	8-759-399-49	IC MM1251BFBE				
							IC501	8-759-701-51	IC NJM2072M(TE2)				
C128	1-104-851-11	TANTAL. CHIP	10uF	20%	10V		IC601	8-759-638-51	IC LB1979VS-TLM				
C129	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V								
C130	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V				<JACK>				
C131	1-104-851-11	TANTAL. CHIP	10uF	20%	10V		J101	1-785-791-11	JACK (EAR)				
C132	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V		J102	1-785-790-11	JACK (MIC (PULUGIN POWER))				
C133	1-110-569-11	TANTAL. CHIP	47uF	20%	6.3V		J103	1-794-615-11	JACK,DC(POLARITY UNIFIED TYPE) (DC IN 3V)				
C134	1-104-357-11	ELECT	47uF	20%	6.3V								
C135	1-104-851-11	TANTAL. CHIP	10uF	20%	10V				<INDUCTOR>				
C136	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V								
C153	1-124-434-00	ELECT	220uF	20%	4V		L301	1-412-032-11	INDUCTOR CHIP 100uH				
C154	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V				<TRANSISTOR>				
C155	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V		Q101	8-729-013-37	TRANSISTOR 2SC4213-AB-TE85L				
C301	1-104-847-11	TANTAL. CHIP	22uF	20%	4V		Q102	8-729-402-96	TRANSISTOR UN5114				
C302	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V		Q103	8-729-013-37	TRANSISTOR 2SC4213-AB-TE85L				
C303	1-115-156-11	CERAMIC CHIP	1uF		10V		Q104	8-729-402-96	TRANSISTOR UN5114				
C304	1-104-354-31	ELECT	10uF	20%	6.3V		Q301	8-729-230-63	TRANSISTOR 2SC4116-YG				
C305	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V		Q302	8-729-402-96	TRANSISTOR UN5114				
C501	1-104-851-11	TANTAL. CHIP	10uF	20%	10V		Q303	8-729-011-52	TRANSISTOR UN5117-TX				
C502	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V		Q304	8-729-402-93	TRANSISTOR UN5214				
C503	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V		Q305	8-729-402-93	TRANSISTOR UN5214				
C504	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V								

MAIN LED

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<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
172	1-548-582-11	COUNTER, TAPE (SMALL TYPE)	
HE901	1-500-515-11	HEAD, MAGNETIC (ERASE)	
HRP901	1-500-717-11	HEAD, MAGNETIC (RECORE/PLAYBACK)	
M901	1-763-772-11	MOTOR, DC (CAPSTAN/REEL)	
		(INCLUDING PULLEY)	
MIC901	1-542-298-11	MICROPHONE, ELECTRET CONDENSER	
SP901	1-529-188-11	SPEAKER (3.6CM)	

ACCESSORIES			

3-234-084-01		MANUAL, INSTRUCTION (JAPANESE) (JEW)	
3-234-084-11		MANUAL, INSTRUCTION	
		(ENGLISH, FRENCH, SPANISH) (E)	
3-234-084-21		MANUAL, INSTRUCTION	
		(PORTUGUESE, SWEDISH, FINNISH) (E)	
3-234-084-41		MANUAL, INSTRUCTION	
		(ENGLISH, SLOVAK, RUSSIAN) (JEW)	
3-234-084-51		MANUAL, INSTRUCTION	
		(TRADITIONAL CHINESE, SIMPLIFIED CHINESE,	
		KOREAN) (JEW)	
3-234-084-71		MANUAL, INSTRUCTION	
		(ENGLISH, SIMPLIFIED CHINESE) (CH)	
3-234-084-81		MANUAL, INSTRUCTION	
		(ENGLISH, TRADITIONAL CHINESE) (1E)	

REVISION HISTORY

Clicking the version allows you to jump to the revised page.

Also, clicking the version at the upper right on the revised page allows you to jump to the next revised page.

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